

REMARKS

Applicant thanks the Examiner for having a telephone interview with Applicants' representatives on September 15, 2003, to discuss the application and the Office Action. During the interview, the Examiner suggested that Applicant should amend the claims to more clearly define the "solution containing water as a solvent" as recited in, for example, claim 21. Accordingly, Applicant proposes amending claims 21-23 as suggested by the Examiner. No new matter is added by the proposed amendment. Upon entry of the Amendment, claims 2-4, 6, 9-10, 12-14, 16, 19, and 21-23 remain pending.

In the Office Action, the Examiner rejected claims 2-4, 6, 9, 21, and 23 under 35 U.S.C. § 102(b) as being anticipated by Yoko (JP-7-135140) as evidenced by Forester et al. (U.S. Patent No. 5,952,243); rejected claims 10-14, 16, 19, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Yoko as evidenced by Forester et al., and in view of May et al. (U. S. Patent No. 5,950,106).

Applicant respectfully traverses the rejections under 35 U.S.C. §§ 102(b) and 103(a).

In order to properly anticipate Applicants' claimed invention under 35 U.S.C. §102, each and every element of the claim in issue must be found, "either expressly or inherently described, in a single prior art reference." "The identical invention must be shown in as complete detail as is contained in the . . . claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." See M.P.E.P. § 2131, 8th ed., 2001.

Applicant submits that Yoko, as evidenced by Forester et al., fails to teach each and every element of independent claim 21.

Claim 21, as Applicant proposes to amend it, recites, *inter alia*, “forming a lower resist film over a surface of a substrate; forming an upper resist film on the lower resist film, said upper resist film being insoluble in water; patterning the upper resist film to form an upper resist pattern; forming a covering layer containing silicon or a metal on the upper resist pattern by a coating method using an aqueous solution of a water-soluble polymer containing silicon or a metal; . . . and etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask.”

As Applicant argued in the previous Amendment and Remarks filed on May 6, 2003, Yoko’s SOG film is an organic SOG made by Tokyo Ohka Kogyo Co., Ltd., with the trade name OCD T-7 6000-R. See Paragraph [0013] of Yoko. This SOG film is formed from a solution containing an organic solvent, rather than a solution containing water as a solvent. See Amendment and Remarks of May 6, 2003, page 7.

However, the Examiner alleged that “Yoko inherently teaches that the SOG film contains water as a solvent during the coating process.” The Examiner referred to Forester et al., col. 3, lines 59-64, as allegedly evidencing that SOG film contains water as a solvent. See Office Action, pages 3 and 4.

To traverse the Examiner’s allegation, Applicant quotes the language of Forester et al. relied upon by the Examiner: “Suitable solvents non-exclusively include water and organic solvents in an amount sufficient to form a uniform solution or dispersion of the dielectric material.” Col. 3, lines 62-64. It appears that the Examiner construed this statement of Forester et al. as teaching that an SOG necessarily contains water as a solvent. See Office Action, pages 3 and 4. Applicant respectfully disagrees with the

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Examiner. Applicant submits that a more reasonable understanding of Forester et al.'s statement would be that some SOGs contain water as a solvent, others contain an organic component as a solvent, and that not all SOGs contain water as a solvent.

Forester et al. discloses several SOGs, such as Accuglass® 311 in Examples 1-4, Accuglass® 203AS, P112A and P114A in Example 5, and Accuglass® 418 in Example 9. Applicant submits that these SOGs contain only organics as solvents. For example, the main components of the solvents in Accuglass® P112A and P114A are ethyl alcohol, isopropanol, and acetone. Although they might contain some water, the amount of water contained therein is substantially small. Under such circumstances, one skilled in the art would not recognize the small amount of water as a solvent, and such a solution would not be recognized as "an aqueous solution." In other words, an SOG solution does not necessarily contain water as a solvent.

In fact, Yoko's SOG film, OCD T-7 6000-R made by Tokyo Ohka Kogyo Co., Ltd., although inevitably contains some water in its solution, only contains a substantially small amount of water (2%). Therefore, the solution is generally NOT recognized as containing water as a solvent.

By the proposed Amendment, Applicant would amend the recitation of "a solution containing water as a solvent" in claim 21 to "an aqueous solution." One of ordinary skill would appreciate that "an aqueous solution" is merely another way of saying "a solution containing water as a solvent," if not clearer. Therefore, in view of the above rationale, Applicant submits that Yoko, as evidenced by Forester et al., does not teach, either expressly or inherently, "an aqueous solution," as recited in claim 21.

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Moreover, Applicant also argued in the Amendment and Remarks filed on May 6, 2003, that the SOG of Yoko is actually a water-insoluble polymer, instead of “a water-soluble polymer,” as recited in claim 21. Further, Applicant wishes to repeat their argument that, in Yoko, the removal of upper resist 4 and the patterning of the lower layer resist 2 are two separate steps, while claim 21 requires “etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask,” which is a single step. *See* Amendment and Remarks of May 6, 2003, pages 7-8.

Therefore, Yoko, as evidenced by Forester et al., fails to teach, either expressly or inherently, at least “an aqueous solution of a water-soluble polymer containing silicon or a metal,” and “etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask,” as recited in claim 21. Thus, claim 21 is patentable over Yoko as evidenced by Forester et al. under 35 U.S.C. § 102(b).

Claims 2-4, 6, and 9, which depend from claim 21, are also patentable over Yoko at least because of their dependency from an allowable base claim.

Similarly, claim 23, as Applicant proposes to amend it, recites, *inter alia*, “forming a covering layer containing silicon or a metal on the upper resist pattern by a coating method using an aqueous solution of a water-soluble polymer containing silicon or a metal; . . . and etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask.” For reasons already set forth in the above, claim 23 is also patentable over Yoko as evidenced by Forester et al.

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Applicant further traverses the rejection of claims 10-14, 16, 19, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Yoko as evidenced by Forester et al., and further in view of May et al.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. §2143, 8th ed., February 2003.

Applicant first submits that, as discussed above, Yoko, as evidenced by Forester et al., fails to teach or suggest each and every element of claim 21, from which claim 10 depends. Particularly, Yoko, as evidenced by Forester et al., fails to teach at least "using an aqueous solution of a water-soluble polymer containing silicon or a metal," and also fails to teach or suggest at least "etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask," as recited in claim 21.

Moreover, Yoko specifically requires that "about SOG, it is optimal to use organic" because it does not need "an elevated-temperature cure." See paragraph [0018] of the translation of Yoko provided by the Examiner. Therefore, Yoko actually teaches away from claim 21, which recites "using an aqueous solution."

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Also as submitted in the Amendment and Remarks submitted on May 6, 2003, May et al. does not teach or suggest at least "forming a lower resist film over a surface of a substrate; forming an upper resist film over a surface of the substrate; patterning the upper resist film to form an upper resist pattern; forming a covering layer containing silicon or a metal on the upper resist pattern by a coating method using a solution containing water as a solvent which is incapable of dissolving said upper resist pattern; . . . and etching the upper resist pattern and the lower resist film to form a lower resist pattern, using the covering layer remaining in the open portion as a mask," as recited in claim 21. In other words, May et al. fails to cure the deficiencies of Yoko as evidenced by Forester et al. with regard to claim 21.

Therefore, Yoko, as evidenced by Forester et al., further in view of May et al., does not teach or suggest each and every element of claim 21. They actually teach away from the recitations of claim 21. One skilled in the art would therefore not be motivated to combine Yoko and Forester et al. with May et al. to result in the present invention as claimed in claim 21. Nor would there be any reasonable expectation of success in doing so, in view of such teaching-away references. As a result, claim 21 is patentable over Yoko, as evidenced by Forester et al., and further in view of May et al. Claim 10, which depends from claim 21, is also allowable at least because of its dependency from an allowable base claim.

Similarly, new independent claim 22 recites, among other things, "forming a covering layer containing silicon or a metal on the upper resist pattern by a coating method using an aqueous solution of a water-soluble polymer containing silicon or a metal; . . . and etching the upper resist pattern and the lower resist film to form a lower

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resist pattern, using the covering layer remaining in the open portion as a mask." For reasons already set forth in the above, Yoko, as evidenced by Forester et al., and further in view of May et al., fails to teach or suggest at least these features.

Therefore, claim 22 is patentable over Yoko, as evidenced by Forester et al., and further in view of May et al., and claims 12-14, 16, and 19, which depend from claim 22, are also allowable at least because of their dependency from an allowable base claim.

Applicants respectfully request that this Amendment After Final be entered by the Examiner, placing claims 2-4, 6, 9-10, 12-14, 16, 19, and 21-23 in condition for allowance. This Amendment After Final should allow for immediate and favorable action by the Examiner. Also, Applicants submit that the entry of this Amendment would place the application in better form for appeal, should the Examiner continue to dispute the patentability of the pending claims. Applicants, therefore, request the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims 2-4, 6, 9-10, 12-14, 16, 19, and 21-23.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully Submitted,

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